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VOL. XIII, No. 8 WASHINGTON AUGUST, 1902

THE NATIONAL GEOGRAPHIC MAGAZINE

PROBLEMS OF THE PACIFIC—THE COMMERCE OF THE GREAT OCEAN*

BY HON. O. P. AUSTIN,

CHIEF OF BUREAU OF STATISTICS, TREASURY DEPARTMENT

THE problem of the Pacific, from the commercial standpoint, seems at first sight a difficult one. To transport commerce across a great ocean which stretches literally half way round the globe is no small undertaking. And to do this in competition with countries lying thousands of miles nearer to that great and exacting market of the Orient is a task which would scarcely be undertaken by other than American energy and by the descendants of those older commercial nations—England and Germany—whose ships now penetrate every sea, and whose commercial representatives are found in every country. Even American energy and commercial enterprise have looked askance at this great task during the years in which the problems of the home market and home development were under consideration. Railroads were needed to develop the great interior of our own country, and their construction was followed by the development of the farms and forests and mines of the great interior and the manufacture of the natural products with which this great country had been so lavishly endowed.

But these great undertakings have been accomplished. The country has been gridironed with railroads. Six great transcontinental lines connect ocean with ocean, and others connect the Lakes with the Gulf, while their lateral branches leave scarcely a material section of the country without direct and cheap transportation to the water's edge. The producing areas thus opened, whether agricultural, forest, or mining, have poured out their treasures; the ready capitalist and the busy workman, aided by the genius of the scientist and the inventor, have turned these natural products into form ready for consumption. The great home market has been supplied, and the producer, the manufacturer, and the capitalist are now seeking new worlds to conquer. The boundless energy which constructed railroads, developed farms, opened mines, invaded forests, and constructed factories, hav-

* An Address before the National Geographic Society, April 2, 1902.

ing succeeded beyond its greatest expectations, now turns its attention to the next great problem, that of finding in other countries a market for the ever-increasing surplus which that energy is producing at home.

In addition, however, to these products of our fields, and mines, and forests, and factories, there are certain articles required for use in manufacturing and for food and drink which we do not and probably cannot produce at home. The raw silk, and fibers, and rubber, and cabinet woods, and chemicals, and dyestuffs for use in manufacturing; the tea, and coffee, and cocoa, and sugar, and rice, and tropical fruits and spices required as food and drink, must be supplied in part or in whole from abroad, and they form and must continue to form an ever-increasing part of our imports. We bring every day in the year a million dollars' worth of these tropical and subtropical products from other countries. We want to pay for these necessities of daily life—necessities which we cannot produce at home—with the products of our farms and mines and forests and factories, and also find a market for the hundred millions of dollars' worth of our surplus that still remains after paying for all these necessary imports.

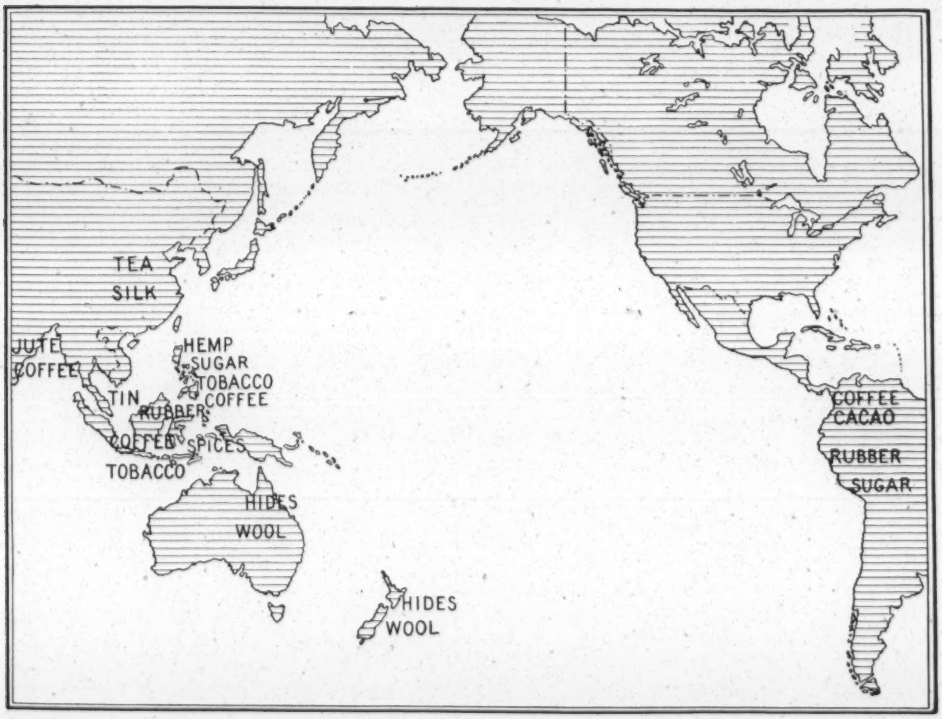
It is because of these conditions, increasing in intensity as our surplus grows and our demand for tropical goods in exchange also grows, that we are looking abroad with increased interest and anxiety every day, that our manufacturers and merchants are building and buying ocean fleets, that our capitalists are extending their cable lines to distant countries and islands, that our producers are demanding an isthmian canal, and that our people are commanding the ownership by the United States of tropical gardens which may in time supply many of the articles which we now buy in foreign countries and open new markets for our own productions. And it is to the Pacific that we naturally look for this growth of our commerce. Europe is, of course, the natural market in which to sell our foodstuffs and the materials used in manufacturing, and we are also making good headway there with certain classes of our manufactures; but it is from the countries bordering upon the Pacific that we draw a large share of our tropical and subtropical imports, and among their enormous population—one-half the population of the world—we should find a large market for our surplus breadstuffs and meats and manufactures.

But the exchange, under present conditions, is not easy. Our great producing and consuming centers still lie in the eastern half of the continent, and while we have a magnificent system of railroads connecting them with the Pacific coast, the relative cost of transportation by rail is so much greater than that by water that we cannot expect to successfully compete in the struggle for this Pacific commerce until direct water transportation is supplied between the initial points of production and consumption. Recent estimates of the cost of transporting freights on the Great Lakes compared with that on the railways of the country showed that the average rate per ton per mile was *just one-tenth* as much on the Lakes as on the railroads. While this is doubtless an extreme case, owing to the fact that the Lake freights were chiefly grain, iron ore, and coal, and the average distance between points of shipment and discharge greater than that of the average rail shipments, there can be no doubt that the cost of water transportation *is* much less than that by rail, even under the most favorable conditions for the latter. A *single ocean vessel* of modern capacity will carry as much as 400 railway cars, or 20 trains of 20 cars each; and as a consequence the country which can send its products by water, from the door of the factory to the door of the

consumer on the other side of the globe, is at a great advantage over that which must send its products two or three thousand miles by rail, before placing them upon the vessel which conveys them to the consumer.

Our present all-water routes from the eastern coast to the Orient are 12,500 miles *via* the Suez Canal, 15,000 miles via Cape of Good Hope, and over 16,000 miles *via* Cape Horn and the Pacific; or one-half the distance round the globe if *via* the Suez, and two-thirds the distance around the globe if *via* Cape Horn. Nevertheless, about two-thirds of our commerce with Asia and Oceania still goes across the Atlantic Ocean, rather than undergo the expense of rail transportation to the waters of the Pacific on our own western coast. The disadvantage under which we thus labor in an attempt to compete with our European rivals for the trade with the Orient is shown in the fact that while the distance traversed by a vessel passing from New York to Shanghai is from 12,500 to 16,000 miles, the distance from London to Shanghai is but about 10,500 miles, an advantage to the British merchant of from 2,000 to 5,000 miles, according to the route of the vessels from New York.

In spite, however, of the disadvantage under which our merchants labor in their attempts to cultivate commercial relations with the Orient, our actual commerce with the islands and countries of the great Pacific has grown rapidly in recent years, and more rapidly than that of any other nation. Our imports from Asia and Oceania increased from



Map No. 1. Principal Productions of the Countries Fronting on the Pacific

(see page 307)

105 millions in the calendar year 1891 to 162 millions in 1901, an increase of over 50 per cent, while the total imports of the country were increasing but 10 per cent. Our exports to Asia and Oceania increased from 40 millions in 1891 to 115 millions in 1901, an increase of 180 per cent, while the total exports were increasing but 50 per cent.

This brings us to a consideration of the Pacific and its commercial conditions today and its possibilities when we shall obtain access to it through an Isthmian canal, which we may reasonably expect we are soon to have. Before entering upon a detailed discussion of this, however, it is proper that we should realize the enormous extent of this great body of water—its length and breadth and its comparison in area with that ocean with which we are much more familiar, the Atlantic. The superficial area of this great ocean is 60 million square miles, or 20 times that of the United States, exclusive of Alaska, and it covers more than one-fourth of the entire surface of the earth. Its enormous size will be better realized when we remember that the distance across it at its widest point, where our vessels cross it in the journey to the Orient, is four times as great as that across the Atlantic from New York to Liverpool, and seven times as great as across the Atlantic at its narrowest point, from Pernambuco, Brazil, to Freetown, Africa. The contrast between the great circular Pacific, which vessels must occupy weeks in crossing, and the long, narrow Atlantic, which we are accustomed to ferry as a holiday pastime, can be better realized when they are studied side by side without reference to the great bodies of land adjacent. The Atlantic meanders like a river between Europe and America, spanned by a dozen cable lines and innumerable steamship routes; the Pacific stretches half-way round the globe, with a few island way stations, where the sailing lines converge, in order that the vessels on this long route may take advantage of them as ports of call for repairs, for coal, for water, and for communication with mankind.

These things are not altogether encouraging to the utilization of the Pacific as a highway for commerce, or an exchange of commodities with nations on the other side of its waters. In fact, they appear rather discouraging in some of their aspects, and there are persons who doubt the feasibility of conducting commerce at such long range when the markets of Europe and South America are so much nearer, while others even doubt the advisability of expending a couple of hundred millions in the construction of a canal to give us access to its waters.

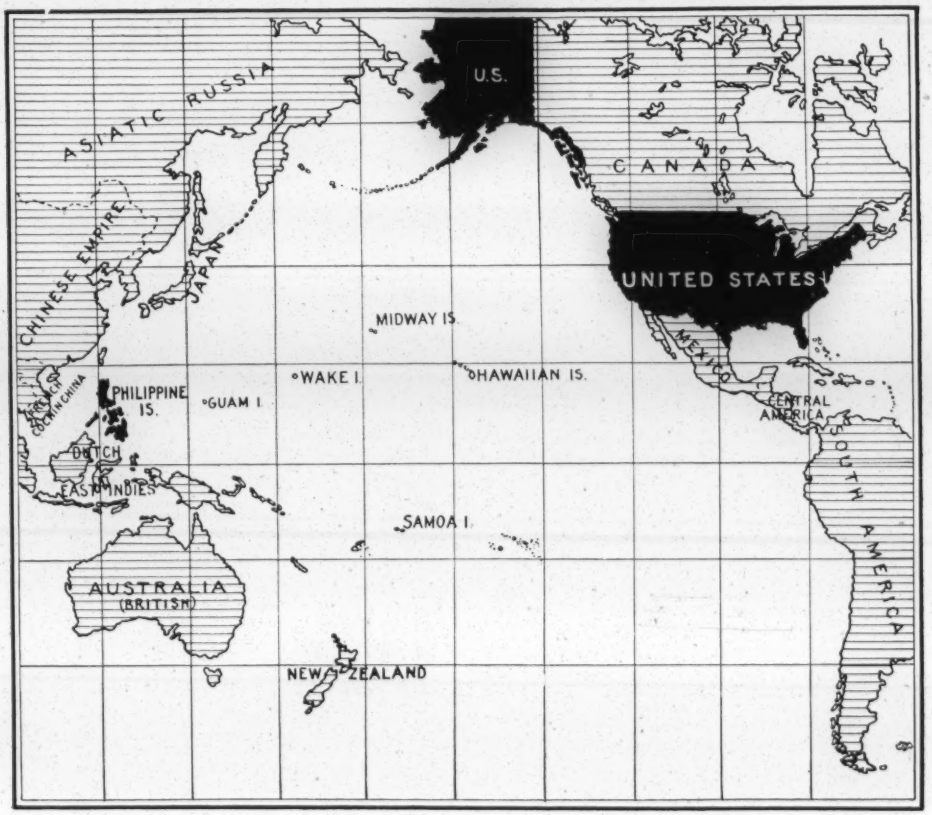
But there is another side of the picture, and one which we must carefully consider: *First.* The countries on the other side of this great ocean produce the articles which we must buy abroad—articles absolutely required by our people, and which we cannot, or at least do not, produce at home. *Second.* These same countries are buying *a hundred million dollars' worth of merchandise every month of every year*, and most of it is the class of goods which we want to sell. *Third.* The United States has greater and better facilities for utilizing this great ocean as a highway of commerce than any other nation has or *ever can have.* This last statement may seem a somewhat startling one, but I shall show you that it is justified, and that conditions provided by nature, and which cannot cease to exist as long as the earth revolves, give to our country exceptional facilities for commerce with the countries fronting upon or contiguous to the Pacific Ocean.

These three great propositions which I have just named I now propose to take up in the order in which they are mentioned.

The countries bordering upon the

Pacific supply in great quantities the articles which form and must always form the bulk of our imports. However much we may encourage and desire to encourage home production, there are certain articles required for food, drink, and manufacturing which we must always import in increasing quantities as our population grows and the products of their workshops are multiplied. The manufacture of silk in our own factories has increased enormously, but the supply of the raw material is entirely drawn from abroad, and the importation of raw silk has grown from a half million pounds in 1870 to over 12 million pounds in 1901; and in no part of the world is silk produced so successfully as in the countries bordering upon the Pacific. The importation of fibers for use in manufacturing has grown from less than 100 million pounds in 1870 to nearly 600 million pounds in 1901, and the best qualities of fibers come from the countries and islands fronting upon or adjacent to the Pacific. India rubber importations for use in manufacturing have grown from less than 10 million pounds to 55 million pounds during the same period; and the countries and islands fronting upon the Pacific are increasing their production of this article. Tea imports have increased 50 per cent since 1870, and practically all of the world's tea comes from the Orient. Coffee importations have grown from 235 million pounds in 1870 to over a billion pounds in 1901, and the best coffee that the world knows comes from the islands of the Pacific. Sugar importations have increased from a little over a billion pounds in 1870 to 4½ billion pounds in 1901, and about one-third of this now comes from the Pacific countries and islands; and the production there is capable of *indefinite* increase. While it is probable and to be hoped that our own people will in time produce their own sugar, it is our duty to consider present conditions and those of the near future in determining the source of supply of this very important article, the importation of which alone amounted to $100,000,000 in value last year. To this list of articles for which we rely upon the tropics, I might add many others, such as tropical fruits and nuts, vegetable oils, spices, cabinet woods, dyes and dye-woods, gums and numerous others. Our total importation of tropical and subtropical products last year amounted to almost $400,000,000, or nearly one-half of our total importations. The importance of having a close commercial relationship with the countries producing the great articles which we so largely import and must always bring from abroad will be better realized when it is remembered that the United States consumes practically one-half of the cane sugar produced in the world, more than one-half of the world's production of coffee, nearly one-half of its production of India rubber, and about one-fourth of its production of raw silk. On the other hand, the equal importance to these Asiatic countries of a close trading relationship with the United States is also found in the fact that these articles which we must have form their chief products for exportation, and that they naturally desire to be in close commercial relationship with the country which is the greatest consumer of their chief products for exportation. For these reasons the establishment of direct transportation routes and close commercial relations is of equal importance to the Orient and to the consumers of the United States.

Turning now to the question of the market offered to our producers and manufacturers, we find conditions in the Orient equally important. Imports into the countries fronting upon and adjacent to the Pacific, other than the United States, aggregate nearly as much as the entire exportations of this country. The imports of China are, in round terms, 190 million dollars; Japan, 140



Map No. 2. National Frontage and Way Stations on the Pacific (see page 311)

millions; Straits Settlements, 150 millions; Australasia, 250 millions; India, which, while not strictly a Pacific country, is in easy reach from its western waters, 300 millions, while adding to these Asiatic Russia, Korea, French Indo-China, Siam, Ceylon, the Dutch East Indies, the Philippines, and Hawaii, the total reaches about one billion three hundred millions. To this we must add, in a statement of the business of the Pacific, the commerce of the American countries fronting upon that ocean, which would bring the total imports, exclusive of those of the United States, up to nearly a billion and a half dollars. Of this vast aggregate of imports a very large share is of the class of materials for which our producers and manufacturers are seeking a market. Of the imports of China, over one-third are cotton manufactures, another third miscellaneous manufactures, including machinery, iron and steel manufactures, and mineral oils, while fish, flour, and canned goods also form a considerable share of the total. In Japan raw cotton, of which we are the world's chief producer, forms the largest item, while manufactures of iron and steel, flour, machinery, engines, kerosene oil, and tobacco also form important factors in the grand total. In Australasia cotton and woolen goods, manufactures of

iron and steel, machinery of all kinds, especially agricultural, cars, engines, and other material for railways, manufactures of leather—in fact, nearly every class of manufacture for which we are seeking a market—enter into and make up the grand total of the very large and constantly growing importations. In British India cotton yarns and cloths, clothing, machinery, metals, hardware and cutlery, railway cars and carriages, engines, and mineral oils form the bulk of the imports. In the other countries and islands, whose imports aggregate a large sum, the class of goods imported is similar to those already named, and are almost exclusively of the class for which our people are seeking a market. Upon the map now presented are shown the figures of the commerce of each of the principal countries of the Orient.

Thus it will be seen that the commerce, present and prospective, of the Orient and the United States may properly be termed complemental: the Orient produces the articles which we must have, and is in many cases the world's chief producer of those articles, while on the other hand it demands, in ever-increasing quantities, the articles which we produce and desire to sell.

Having thus shown that the Orient produces the world's chief supply of the articles which we must always import, and that its chief importations are of articles which we desire to export, I propose to consider the share which we now have in supplying those articles and whether we are succeeding in the attempt to compete with other nations for that trade.

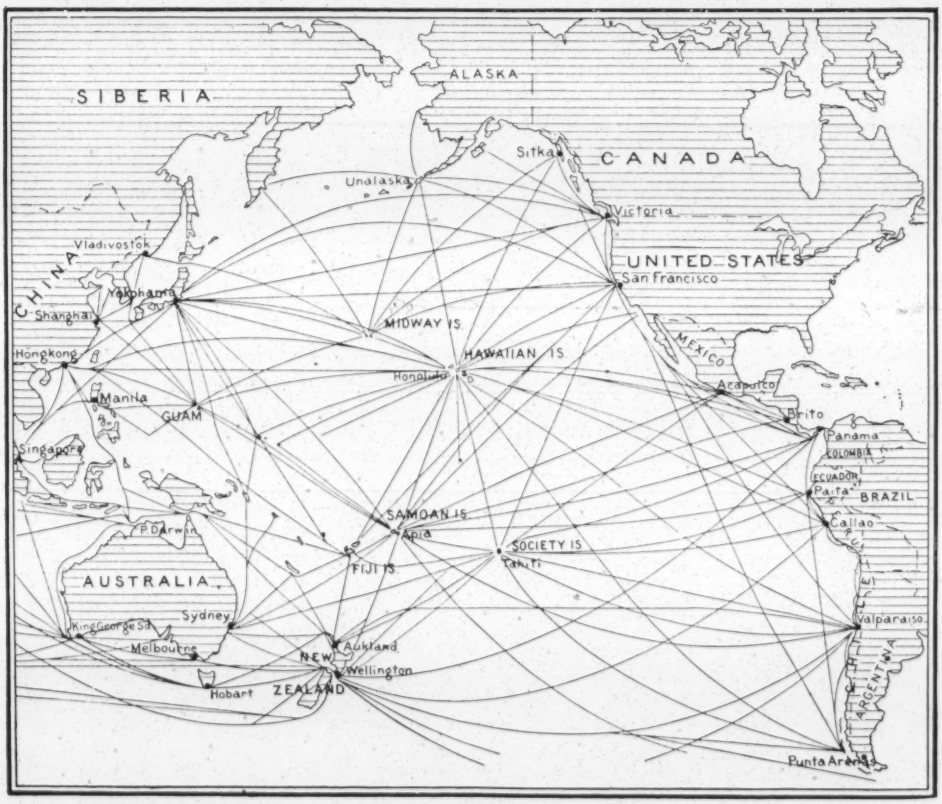
This may be fairly tested by taking the total imports of those countries at decennial periods and learning the share of those imports which were drawn from the United States and the share drawn from our chief rival for that trade—the United Kingdom. I have chosen for the first measurement of that commerce the year 1868, because it immediately preceded the opening of the Suez canal, which occurred in 1869, and by comparing the commerce of that year with that of later dates we may at the same time determine, in some degree, the effect of that artificial waterway upon commerce with the Orient.

In this calculation I have included the commerce of that great semicircle of countries having the Philippines as a central point—China, Japan, Korea, Hongkong, French East Indies, Siam, the Straits Settlements, India and Ceylon, British Australasia, the Dutch East Indies, and the Philippine and Hawaiian Islands—their total population being about half that of the entire globe. I find that the imports of those countries which were, in round terms, 575 millions in 1868, increased to 760 millions by 1880, to 1,025 millions in 1890, and 1,260 millions in 1900, while their exports grew from 588 millions in 1868 to 1,275 millions in 1900, their total commerce having thus considerably more than doubled since the opening of the Suez canal. But this is not all. In this great increase of commercial activity in the Orient, this "awakening of the East," the United States, although at a disadvantage from lack of direct water communication, has made phenomenal gains. In 1868 the countries which I have named took less than $8,000,000 worth of their imports from the United States, or less than 2 per cent of the grand total of their imports.

By 1880 they had increased that sum to over 30 millions; in 1890 it was more than 60 millions, and in 1900 over 110 millions, or about 14 times as much as in 1868, and forming 10 per cent of the grand total of their imports, instead of 2 per cent, as in 1868. At the same time we dealt generously with them in our purchases of their raw silks, and teas, and rice, and sugar, and tobacco, and spices; and their exports to the United States grew from 22 millions in 1868 to 162 millions in 1900. Meantime their

imports from the United Kingdom, our chief rival in that trade, increased from 310 millions to 462 millions, an actual gain of about 150 millions, while the United States, despite her disadvantages in longer water routes, was gaining over 100 millions. Stated in percentages, the contrast as to growth is much more striking, even startling, the increase being for the United Kingdom about 50 per cent, and for the United States more than 1000 per cent. Even with this rapid gain, however, we are still supplying but about 10 per cent of the imports of the Orient, while our European rivals supply about 50 per cent.

Having thus shown, as it seems to me, that the countries bordering upon the Pacific produce the articles which we require; that they require, in exchange, the articles which we produce and desire to sell; that our share in the supplying of that trade has increased more rapidly than that of our chief rivals, and that a large market still remains for us to supply when we have direct access to it, I come to the final proposition, namely, that with proper access to the Pacific we shall have greater and better facilities for conducting commerce with them than any other nation. In support of this proposition I propose to show: *First.* That we have a greater coast line and more and better harbors on the Pacific than any other nation; *Second.* That we have more railway lines to serve as land carriers for that commerce than all the other countries



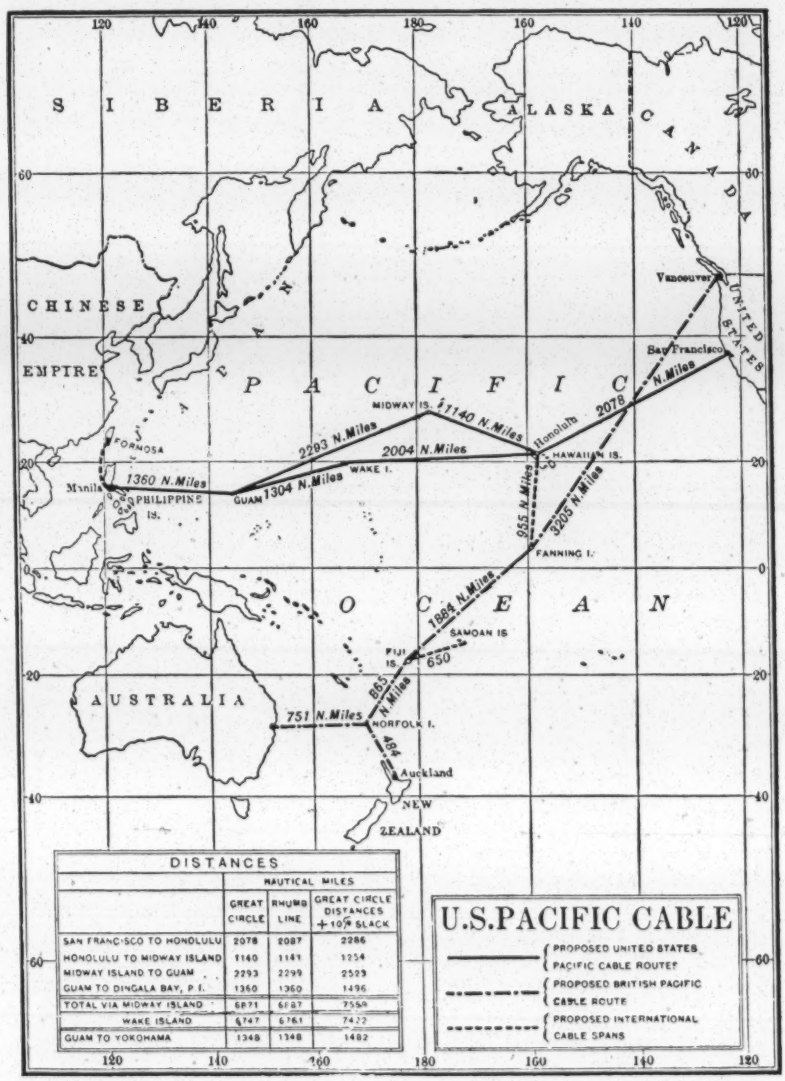
Map No. 3. Transportation Routes of the Pacific (see page 313)

put together; *Third*. That we own the chief way stations of commerce on that ocean, the island ports of call which are important in an ocean of such vast distances; *Fourth*. That we control the best and nearly the only practicable route on which to lay submarine cables across the ocean—an important factor in a consideration of its commercial possibilities; *Fifth*. That at Manila we have an extremely valuable distributing point for commerce for all parts of the Orient; and *Sixth*. That nature has given to the North American continent great and remarkable advantages for commerce across this ocean—advantages which must continue to exist as long as the continent and the ocean continue in their present relation.

In support of the first of these propositions I present a map showing the coast line of the principal nations having a frontage upon and harbors in the Pacific. It will be seen that our Pacific coast line is not only much longer than that of any other nation, but that in its relation to the great producing land masses of the Temperate Zone it far exceeds that of any other single country. A statement kindly furnished me by the Coast and Geodetic Survey shows that the national frontage upon the Pacific, considering only the number of nautical miles to be protected, patrolled, or lighted, is: United States, 12,425 miles; United Kingdom, 9,975 miles; Russia, 6,260; Japan, 4,590; China, 3,130; Netherlands, with her numerous long and narrow islands, 10,860; Mexico, 3,280; Chile, 2,460, and Peru, 1,530 miles. This magnificent Pacific frontage of the United States stretches, with but a comparatively small interruption, from Mexico to the northernmost boundary of the Pacific, thence by the Aleutian Islands almost to the northern limits of Japan, while just south of Japan's possessions our Philippine Islands again stretch for more than a thousand miles along the Asiatic coast. Add to these our island possessions in the midst of the Pacific, containing, as they do, the best island harbors of the entire ocean, and it will be seen that we are justified in the statement that the United States possesses more coast line and better harbor facilities than any other nation fronting on the Pacific.

The second proposition—that we have better railroad facilities for transporting commerce to and from the water's edge—it is hardly necessary to discuss, but it can be better realized by a momentary study of a map showing the railroad lines stretching inland from the eastern and western coasts of the Pacific. Russia has a single great railroad line penetrating the interior from the Pacific coast, but it traverses a country still undeveloped and with a comparatively small population; and while our nearer neighbor, Canada, has a single transcontinental line, the United States has six distinct lines connecting the Pacific with the magnificent system of railway lines in the Mississippi valley and the Atlantic seaboard. In the other countries fronting upon the Pacific the railroads leading inland from the ocean are so few and short that they are scarcely to be considered in comparison with our magnificent railway system, whose lines aggregate 200,000 miles, or eight times the circumference of the earth at the Equator.

My next proposition, as to our advantages in the Pacific, is that we own its chief way stations of commerce, the principal islands and harbors in the great midocean. In a comparatively narrow ocean, like the Atlantic, this is of less importance, but in an enormous body of water, stretching half-way round the globe, on which vessels must sail for weeks in passing from one shore to the other, the value of islands midway, and especially along natural routes of commerce, is very great. As harbors of refuge, ports for repairs, coaling, water



Map No. 4. Proposed Routes for Pacific Cables (see page 313)

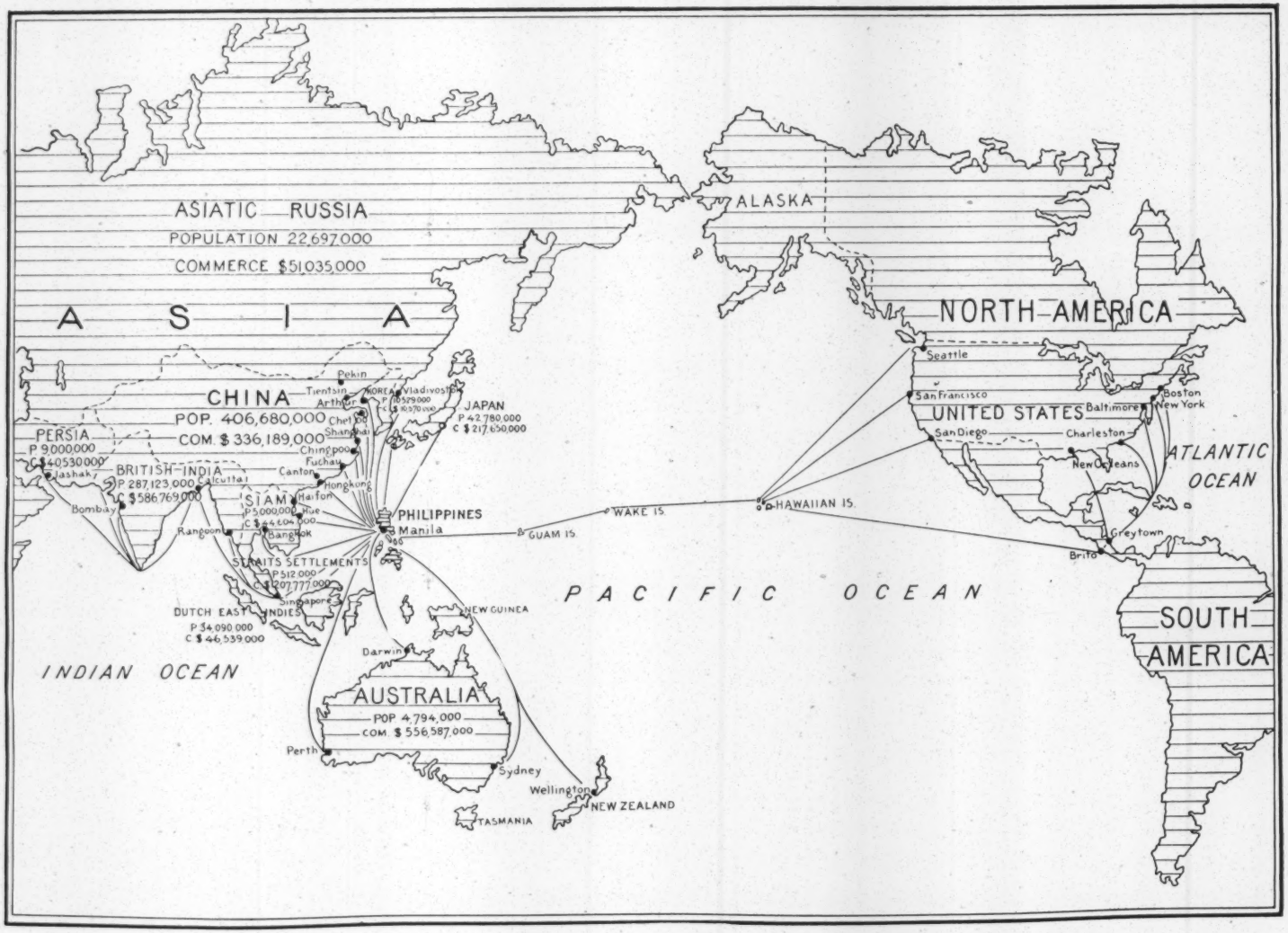
supply, and receipt and delivery of messages, and in some cases the transshipment of cargoes, they are of great importance to commerce, while from the strategic standpoint they are of incalculable value. That they are considered of great importance to the vessels now engaged in this commerce is shown by the fact that the lines of both steam and sailing vessels, crossing the ocean in every direction, converge at practically all of the islands located in the midst of this great ocean. The map showing these routes is prepared by the Hydro-

graphic Office of the Navy Department, and may, therefore, be considered authoritative on this subject. It will be seen that there are, in the midst of this great ocean, a half dozen points distinctly marked by these converging routes for both steam and sailing vessels, and a closer examination will show that the United States owns practically all of these, and especially those which have harbors of importance. At Unalaska on the north, Midway Island, the Hawaiian group, Tutuila, in the Samoan group, and Guam, in the Ladrones, the American flag flies, as it also does at Manila, farther to the west; and it is generally conceded that Pearl Harbor, in the Hawaiian group, and that of Pango Pango, in the Samoan, are by far the best, if not the only valuable, harbors in all the mid-Pacific. Curiously, all of these are located upon the natural routes for vessels in direct commerce between the United States and the Orient, and their importance, both to commerce and for naval and strategic purposes, can scarcely be overestimated.

My next proposition is that we also possess the most important routes for submarine cables, those great and important aids to commerce. The Pacific Ocean is the only great body of water in the inhabited portions of the globe which the ingenuity of man has not already bridged for the instantaneous transmission of thought. Within the remembrance of the present generation the Atlantic, the Mediterranean, the Indian Ocean, and the Gulf of Mexico have been crossed and recrossed with cable lines by which man speaks with man across thousands of miles of water, while the borders of the great continents in every part of the world have been festooned with loops of cable which connect their coast cities one with another and with the commercial centers of every part of the world. But up to this time the task of stretching a cable across the great Pacific, with its 10,000 miles of continuous water, has not been undertaken.

The Atlantic is crossed by a dozen lines connecting the United States with England and the continent of Europe; numerous lines are laid across the Mediterranean; several also extend through parts of the Indian Ocean, along the eastern coast of Asia and across to Australia, and shorter loops stretch from city to city along the coasts of Asia, Africa, and North and South America, but the great Pacific is an entire blank in the matter of intercontinental lines. Messages from the United States to the Orient at present go via Europe, through the Indian Ocean, skirting the eastern coast of the Asiatic continent, traveling enormous distances, handled several times, and occupying considerable time in transmission, to say nothing of the high rates of toll which must be paid for this circuitous service.

The experience of cable builders and operators is that a distance of 3,500 miles is about the limit at which cables can be satisfactorily operated without way stations, at which the messages are transmitted from section to section of the line. It is because of this fact and because there are few places in the Pacific in which islands are so located as to furnish the necessary way stations for relays that the construction of submarine telegraphs across that ocean has not been undertaken. Even where islands exist at such intervals as to justify the attempt, they were so divided in national control that no country or group of capitalists cared to undertake this enormous task. But now all this is changed. The events of the past three years have brought under the control of the United States a line of islands stretching at convenient intervals from the western coast of America to the eastern coast of Asia. The Hawaiian Islands, Wake Island, Guam, and the Philippines form a continuous line of great natural telegraph poles upon



Map No. 5. Manila as a Distributing Point for Commerce (see page 315)

which we may string a wire or series of wires, by which we may converse across this great body of water, stretching half way round the globe, making every one of its intermediate landings and relay stations on our own territory and protected by the American flag.

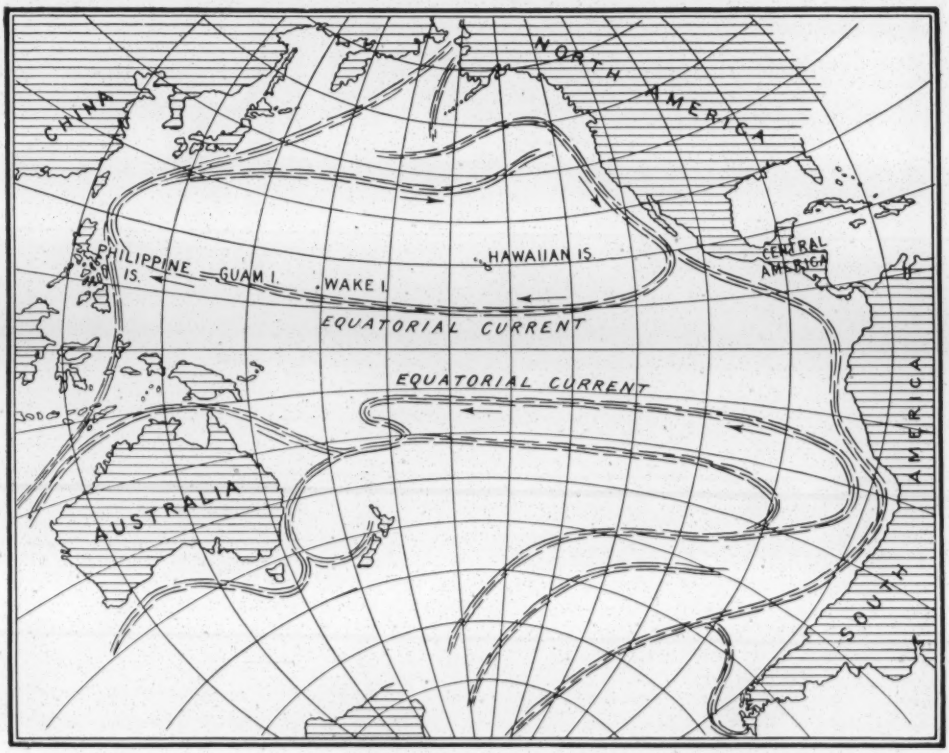
Meantime England has decided to attempt to connect the western coast of Canada, *via* Fanning Island, the Fiji group, and Norfolk Island, with her Southern Pacific possessions of Australia and New Zealand. The proposed routes of these two cable systems are shown on the map here presented.

It is proposed to also construct connecting links between Fanning Island and the Hawaiian Islands, and by a short side line connect the Samoan group with the main line. This would give to the American and the British lines an opportunity for an interchange of business and put all the important groups of the Pacific—the Hawaiian group, the Samoan Islands, the Fiji group, Guam, and the Philippines—in direct cable communication with our western coast, and enable vessel owners and owners of their cargoes to communicate with them en route to and from this great market which we are seeking to invade.

My next suggestion is that we have in the city of Manila a most valuable distributing point for commerce destined for the Orient. Located at a point where the steamship and sailing lines of the western Pacific converge, it becomes at once an important port of call, transshipment, and exchange, and lying midway between the great business centers of the Orient—Yokohama, Shanghai, Canton, Singapore, Calcutta, the Dutch East Indies, and the cities of Australia—it furnishes a base for commercial operations, a point where American warehouses filled with American goods will be accessible by cable and quick steamer transportation for all these points now so far removed from great European and American trade centers. That these natural distributing points are of great strategic importance to the commerce of the nation controlling them is illustrated in the growth of the commerce of the United Kingdom in the Orient since the establishment of Hongkong and Singapore as distributing stations for her commerce. Hongkong became a British colony in 1842, and Singapore at a somewhat earlier date. In 1840 the exports of the United Kingdom to the countries adjacent to these commercial stations amounted to but about $10,000,000, while today it is $125,000,000. While it is not assumed that this increase is entirely due to the control of these commercially strategic points by the United Kingdom, their great importance for such purposes is generally admitted. That our control of Manila is likely to be not only beneficial to American commerce, but even to establish us as a formidable rival in the trade of the East, is admitted by that distinguished British writer, Archibald R. Colquhoun, whose familiarity with conditions in the Orient makes him a recognized authority upon these topics. In his work entitled "The Mastery of the Pacific," recently issued, he says:

"The presence of America in the Philippines and the consequent shifting of the center of activity considerably to the east of Hongkong open a grave possibility, for it is obvious that Hongkong will in the future be out of the direct trade routes between Australasia, the Malay Archipelago, and the great markets of America. . . . The possibility of Manila becoming a serious rival does not at present seriously exercise the Hongkong merchant or ship owner, but . . . there are evident signs that the United States mean to make an important center of the capital of the Philippines. . . . Among the most significant factors of the Pacific situation is the advent of Russia coming *over-*

Map No. 5. Manila as a Distributing Point for Commerce (see page 315)



Map No. 6. The Air and Water Currents of the Pacific (see page 317)

land to the Pacific littoral, . . . and, on the other hand, the sudden appearance of the United States coming oversea and establishing herself in a large, populous, and important archipelago on the borders of Asia." In closing this discussion Mr Colquhoun adds these significant words: "The United States, in the opinion of the writer, will be the dominant factor in the mastery of the Pacific. She has all the advantages, qualifications, and some of the ambitions necessary for the rôle, and her unrivaled resources and fast-increasing population provide the material for future greatness."

These words from this high authority, a representative of the present chief factor in the trade of the Orient, are significant, and they become more so when considered in conjunction with a map which I now present, illustrating the position of Manila as a distributing point for the commerce of that great semicircle of countries stretching from Bering Strait to Australasia, containing half the population of the earth and importing a hundred million dollars' worth of merchandise every month of the year.

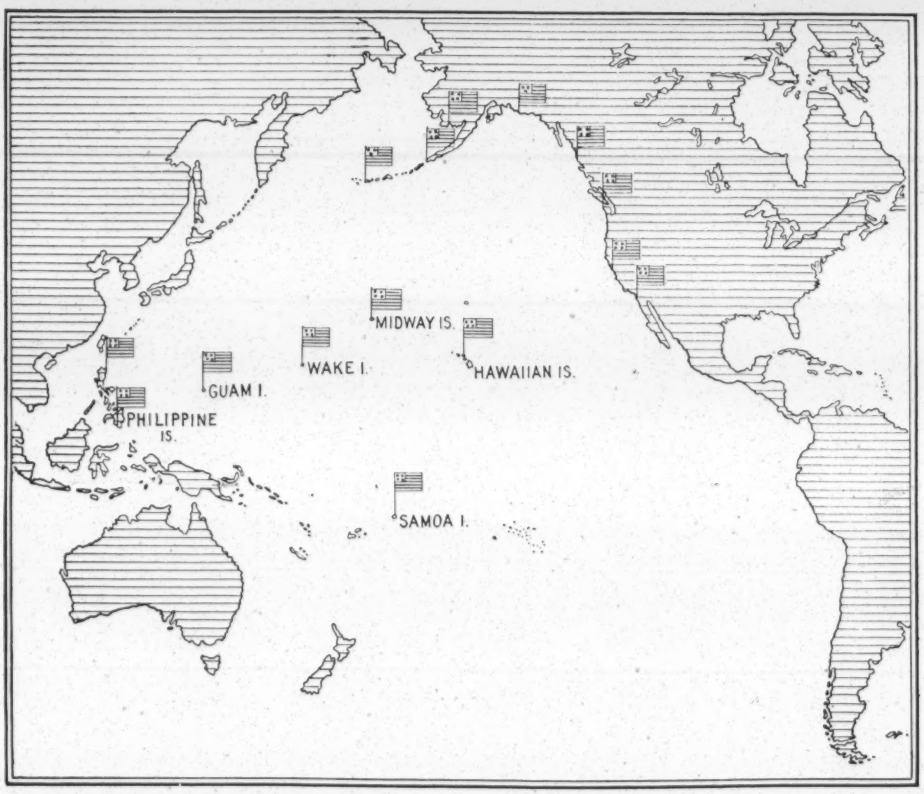
I come now to my final proposition—that in certain great natural conditions, conditions which are as unchangeable as the oceans and the continents and the revolution of the earth itself, nature has given to the United States marked advantages regarding the movements of vessels between her western shores and

the eastern coast of Asia, where the trade of the Orient must always center, and in this belief I find myself fully supported by the practical opinion and experience of distinguished officers of the American and British navies whom I have consulted and by men who have had long experience in the commerce of that great ocean. These advantages to which I allude are found in the great and permanent currents of air and water which flow westwardly across the Pacific in the vicinity of the Equator, turning northwardly along the coast of Asia, and, following the Japan coast, again move toward the east across the north Pacific and down the western coast of North America to the point of beginning. In the map herewith presented are shown the ocean currents and the currents of air, the direction of the movement in each case being shown by arrows. It will be seen that the equatorial current begins its westward movement at the very point in which vessels from an isthmian canal would enter the Pacific, and moves steadily westward to the vicinity of the Philippines, then, turning northward along the east coast of China and Japan, is deflected to the east, flows eastwardly across the north Pacific to the American coast, and then moves down the western coast of the United States to the point of beginning. The air currents, while their exact location is somewhat affected by the changes of the seasons, follow practically the same lines and are equally certain and reliable. The rate of speed at which this ocean current flows in its great circular movement across the Pacific and returns is probably on an average about one mile per hour, or 24 miles per day, while the rate of the movement of the air currents is of course much more rapid. While there is a general belief that vessels propelled by steam are little affected by favorable or adverse winds, a series of experiments recently made by German navigators and scientists shows that even with high-power steam vessels of modern type a difference of from 50 to 100 miles per day is realized in traveling with or against winds of any considerable power.

These facts, it seems to me, justify me in the assertion which I have made and now repeat, that this steady, permanent flow of air and water—a flow which will never cease so long as the earth revolves toward the east and the great bodies of land and water retain their present relative positions—must always give to the North American continent a marked advantage in the commerce of the Pacific. Its vessels from the eastern coast, entering this great whirlpool of the Pacific at the Isthmus, will move westward, aided by air and water currents, past our Hawaiian Islands, Wake Island, and Guam to the Philippines; thence northward to those two great trade centers, Shanghai and Yokohama, and thence, still following these currents, will move to the east along that shortest route known as the "great circle," in the north Pacific, touch at our own western ports for transshipment of fast freights for the East, and then, still following the ocean current down our Pacific coast, will reach the entrance to the Isthmian canal, having been aided by favorable currents of air and water in the entire circular tour of 18,000 miles. The entire feasibility of this plan is found in the fact that, while the actual sailing distance from the western end of the proposed Nicaraguan canal to Manila *via* Hawaii and Guam is 9,000 miles, the return trip from Manila *via* Shanghai, Yokohama, and San Francisco to Brito is but 9,500 miles, with the advantages of favorable wind and current in practically every mile of the entire distance.

I close, then, by the assertion that at least one of the great problems of the Pacific, that of commerce, has been solved, and solved in favor of the United

States. In the exchange of mutually necessary commodities, in length of frontage upon the ocean, in harbors, in way stations for vessels and cables, in advantageous points for distribution and concentration of trade, and even in the currents of air and water which nature has given, the conditions favor the United States. Indeed, when we consider all these things, we might almost claim the Pacific as essentially our own. Stretching along its eastern coast from the tropics to the Arctic, thence across its northern borders, then for more than a thousand miles on its western shore, in the Samoan group on the south, and in a line of islands across its very center, the American flag floats, and will continue to float, and by its presence, its ennobling purposes, and its power for civilization and advancement it proclaims, and will continue to proclaim, that the Pacific is, and will remain, an American ocean.



Map No. 7. "The Pacific is, and will remain, an American Ocean"

SHORTENING TIME ACROSS THE CONTINENT

By Henry Herbert McClure

TWENTY hours to Chicago, forty-five hours to Denver, ninety hours to the Pacific coast—these are the new records for long-distance transportation, taking New York city as the starting point, which indicate a general movement on the part of the great railroad systems of the country to save time across the continent and to draw closer together the important cities along the way. The establishment of the twenty-hour trains between New York and Chicago on June 15th may be said to mark the new era of transportation. Interest in that initial event had not subsided before there began a service out of Chicago which landed passengers in Denver in twenty-five hours, and plans are now being made whereby the transcontinental systems will run trains from Chicago to Los Angeles in something less than three days' time.

The movement is significant of genuine twentieth-century progress, and the new conditions may in a sense be said to have come about because of the need for improved facilities. It was well that the railroads should keep pace with the rapid movements of modern life just as formerly they were pathfinders and pace-makers for civilization itself. These United States owe much to the railroad systems, which have ribbed it with bands of steel and changed it from a tremendous territory which required months to cross into a community of farms, factories, towns, and cities.

The accomplishment of these new records and their maintenance as a regular daily occurrence places this country in the fore rank so far as railway facilities and fast long-distance speed are concerned. It is true that the Sud Express on the Orleans and Midi Railroad, running from Paris to Bayonne, makes an average of five miles per hour more than the Twentieth Century Limited of the New York Central, but the French train travels only half as far as the American. As a matter of fact, however, few trains in the world cover such long distances as those in this country, and comparisons are scarcely just. For example, the Siberian Express, running between Moscow and Irkutsk, makes 3,400 miles in eight days, an average of about one-third the speed of our trains. No one would regard this record as representing the best that Russian trains could do over distances of from 500 to 1,000 miles.

When the twenty-hour trains between New York and Chicago were first put on, they were designed to carry passengers and a limited amount of baggage only. The trains were made up of four cars—a buffet smoking and library car, two twelve-section drawing-room state-room cars, and one state-room observation car. On certain sections of the lines a dining car was added to each train. Within a few days, however, the government arranged for the addition of one mail car to each of these twenty-hour trains, and, as a result, this fast service has come to be of great value to thousands who might never wish to travel in the trains themselves. The new era of transportation at once inspires an interest, which is not merely wonder at its achievements—it becomes a practical, tangible thing, which calls for our appreciation because each one may be benefited by its existence.

The business man of New York city

is now able to mail a letter to his agent in Chicago on Monday and receive his reply on Wednesday morning. A tremendous advantage of the new train service is that, since the mails at New York close now six hours later, a whole business day is gained at St. Louis and points further west; almost a whole business day is gained for Pittsburg, Cincinnati, and Indianapolis. The mails for the new fast trains close at one o'clock in the afternoon at New York. Within an hour on one line, and two hours on the other, these pouches of letters for the west are whirling toward their destination. Columbus gains nearly ten hours by the new service; Cincinnati, seven hours; Indianapolis, eleven hours; Kansas City, eleven hours. In nearly all of the country southwest of St. Louis there is a gain of from ten to twenty-four hours. At St. Louis the gain is twenty hours outside of the business district, and twelve hours inside. Indeed, almost every section of the country has been affected by the new mail schedule made possible by these fast trains. The east-bound mails, of course, make practically the same gain in time. There are minor differences owing to connections at various points. The apparent discrepancies between the gain for business sctions of a city and the gain outside is explained by time of arrival being after business hours.

An amusing feature of the interest taken in these fast trains is the impressions made on those who imagine the trains rocking madly back and forth, taking the curves on two wheels and righting themselves with difficulty, and dashing by the scenery with such swiftness that nothing is to be seen save a blur of green from the fields.

"Guess you had to hold on to the seat some," was one comment.

It is a curious fact, but he who travels on one of these twentieth-century trains can scarcely appreciate more than the results. It does not seem to him that the train is moving swifter than an ordinary passenger train; but when he arrives at his destination, a thousand miles away, eight hours sooner than has been his custom, then he realizes that something unusual has happened en route. He has the feeling that the trip has been exceedingly comfortable, and he may have noticed that his train has made few stops—very short ones; that the engines were changed quickly, and that no time was wasted in getting under way again.

It was the writer's privilege to make the first trip of the Twentieth Century Limited over the New York Central and the Lake Shore Railroads. Aside from one instance, when the train had been delayed by a freight and there were fourteen minutes to be made up within an hour, which was done, it was not possible to distinguish a high rate of speed. An old railroad man was asked where it was that these trains gained eight hours on the average trains running between New York and Chicago.

"Suppose two men started out to run a mile race," he replied. "If one of them had to stop every hundred yards and the other ran right on, which one do you think would win?"

Fewer stops, then, have contributed to the saving of time, but other elements have entered into the matter. During the past five years millions of dollars have been spent in improving track and rolling stock, in shortening distances, and in reducing grades. There is now complete from Boston to Omaha a double-track line of railways. Every mile of this is guarded from wreck by the block signals. Many trains a day travel over the lines with absolute safety. The engines are heavier than formerly. Their capacity for coal and water is greater, and hence longer runs can be made without stops. Where division points were formerly 150 miles apart they are now separated by more

than 200 miles. These are a few of the qualifications for speed.

Indeed, if one desired to account for all of the elements which combine in the result of present-day speed and comfort in long-distance travel it would be necessary to review the whole history of railroading. It is a far cry even from the service of twenty-five years ago to that of today. It is not so long since parlor and sleeping cars were unknown ; twenty-five miles an hour was considered a good speed for a passenger train ; there were no air brakes, no safety devices. Travel, even for five hundred miles, required considerable physical endurance. Now, however, New York to San Francisco is an easier journey than New York to Chicago was formerly. Electrically lighted trains, with library, buffet, dining, sleeping, and observation cars drawn by huge greyhounds of steel, whirl swiftly and safely over a pathway whose every mile is a monument in stone and steel to the engineering ability of our country. The traveler has every comfort at hand—a telephone is at his elbow, a bath-room and a barber shop are at his disposal.

Through the West, at least, as great changes have taken place in the country. In thirty years time the granary of the world has been opened up. Unbroken wastes have given place to thousands of prosperous towns. Maps were made and remade, and a geographical text book was not long in getting out of date. The growth of the West, as well as the development of the East, was not only fostered by the great railroads, but it was met and anticipated by them. Witness the rapid introduction of every modern invention which may be applied to railroading. On the Chicago and Northwestern and the Illinois Central Railroads passengers may telephone from the moving train to any point within the range of long-distance telephony. On a Texas railway wireless telegraphy is now being installed for the purpose of preventing collisions. The new twenty-hour trains between New York and Chicago are lighted with electricity generated by dynamoes attached to the car axles. These are mere details which indicate the struggle for the best service possible.

The New York Central's " Twentieth Century Train " stands first in point of speed, ease of operation, etc., between New York and Chicago. Their mileage is nearly seventy miles greater than that over which the Pennsylvania Special goes, but they have fewer grades and curves. Beyond Chicago the traveler will find four routes to the coast open to him. The Burlington No. 1 has recently increased its speed to Denver so that one hour and ten minutes are saved. Over the Rock Island's El Paso Short Line route will begin a service this fall by which the time to Los Angeles will be considerably shortened. The line to El Paso, completed only this year, is over 200 miles shorter from Kansas City than any other route, but the entire distance from Chicago to Los Angeles on the Rock Island and Southern Pacific is practically the same as that over the Santa Fé route. The former, by reason of a smaller per cent of grades, will be able to make more speed, while the latter will, of course, continue to hold its attraction as a scenic route through the mountains. The Chicago and Northwestern road has recently completed a two-track system to the Missouri River at Omaha—a movement which is part of a plan to make the facilities for travel as good as possible over this and the Union Pacific line to San Francisco. Within a year Salt Lake will be bridged. Millions of dollars are being spent in shortening distances, abolishing grades and curves wherever possible. Our country is becoming smaller all the time, and all because the transcontinental links of steel railways are annihilating space and conquering time with more vigor and result than ever before.

FIELDWORK OF THE UNITED STATES GEOLOGICAL SURVEY FOR THE SEASON 1902

THE following assignments of geologic and paleontologic parties of the United States Geological Survey have been made for the present field season:

Pacific Coast.—Dr J. C. Branner will continue areal surveys on the Santa Cruz quadrangle, California.

Mr J. S. Diller will complete the areal and economic survey of the Redding quadrangle, California, and make a reconnoissance of the Klamath Mountains. He will be assisted by Dr Geo. B. Richardson.

Dr Geo. F. Becker will continue the supervision of the Division of Physical and Chemical Research and the preparation of a report embodying his investigations on the conditions of gold deposition in the Mother Lode of California.

Dr T. W. Stanton will continue a general supervision of the paleontologic work of the Survey, and will carry on fieldwork in coöperation with Mr J. S. Diller in the Klamath Mountains of California.

Mr Geo. H. Eldridge, who has recently completed a study of the oil-fields of California, will devote the coming year to the preparation of a report on this subject and on the phosphate deposits of Florida.

Dr Geo. Otis Smith will continue areal surveys necessary for the preparation of the Snoqualmie folio, Washington. On the completion of his field season in the Cascade Mountains he will survey the Bluehill quadrangle, Maine. He will be assisted by Mr Frank C. Calkins.

Rocky Mountain Region.—Mr J. M. Boutwell and Dr J. D. Irving will study the mining geology of the Park City district, Utah.

Prof. T. C. Chamberlin will continue the supervision of investigations in Pleistocene geology of the United States. He will be assisted by Prof. R. D. Salisbury and Mr W. W. Atwood in the Rocky Mountain region, by Mr Frank Leverett and Mr F. W. Taylor in Michigan, and by Mr W. C. Alden in Winconsin.

Mr S. F. Emmons will continue the supervision of investigations in the Division of Metalliferous Minerals, visiting various mining regions in the west for the purpose of examining work in progress and preparing plans for future work. He will be assisted by Dr J. D. Irving in the completion of work on the Leadville mining district.

Dr N. M. Fenneman will continue the investigation of the Boulder oil field, Colorado.

Mr Arnold Hague will continue the preparation of his monograph on the Yellowstone National Park, and will visit the park for the purpose of obtaining necessary additional information.

Dr T. A. Jaggar will complete the areal work necessary for the preparation of the Boston folio, and will prepare a report on the Bradshaw district, Arizona. He will be assisted by Dr Chas. Palache and Mr Laurence La Forge.

Prof. Wilbur C. Knight will continue the areal and economic surveys necessary for the completion of the Laramie folio, Wyoming.

Dr F. H. Knowlton will devote the year to the completion of reports on the fossil floras of the Puget and Laramie formations.

Mr Waldemar Lindgren has recently returned from a winter field season in Arizona, and will spend the greater part

of the coming year in the preparation of reports.

Prof. H. F. Osborn will continue his investigations on vertebrate paleontology, and under his supervision special examinations will be made of the stratigraphy of the Colorado Jurassic by Mr F. B. Loomis, and of the Bridger, Washakie, and Uinta basins, Wyoming, by Mr W. B. Matthew and Mr Walter Granger, for the purpose of determining the exact stratigraphic position of beds from which fossil collections have heretofore been made.

Dr F. L. Ransome is at present engaged in the preparation of his report on the Globe, Arizona, mining district. Later in the season he will carry on areal and economic surveys for the preparation of the Bisbee folio, Arizona, and for a report on the Bisbee mining district. Dr J. Morgan Clements will be associated with him in this work.

Dr A. C. Spencer will study the areal and economic geology of the Grand Encampment mining district, Wyoming. He will be assisted by Prof. J. Volney Lewis.

Mr W. H. Weed will revisit Montana for the purpose of securing additional information required for the completion of his report on the Butte mining district.

Mr Bailey Willis will continue the supervision of the investigations in areal and stratigraphic geology. He will visit field parties in various parts of the United States, and will investigate the stratigraphy along the eastern base of the Rocky Mountains in Montana and Wyoming.

The Southwest.—Dr George I. Adams will make an areal and economic survey of the Yellville quadrangle in Arkansas, with special reference to the preparation of a report on the Arkansas lead and zinc district. He will be assisted by Prof. A. H. Purdue and Mr Ernest F. Burchard.

Dr Geo. H. Girty will investigate the paleontology and stratigraphy in connection with the work of various geologists in Arkansas, Indian Territory, Texas, and elsewhere.

Mr R. T. Hill will continue his investigation of the economic geology, stratigraphy, physiography, and vulcanism in the Trans-Pecos region of Texas, New Mexico, and Arizona. Dr Girty will be associated with him in this work.

Mr J. A. Taff will continue his areal and economic surveys in Indian Territory. He will be assisted by Prof. S. W. Beyer and Mr J. W. Beede.

The Northwest.—Mr N. H. Darton will continue areal surveys in the Black Hills and the Big Horn Mountains, and will complete a reconnoissance of the Great Plains for the preparation of a map showing the geology and water resources of that region. He will be assisted by Mr C. A. Fisher.

Northern and Eastern States.—Mr M. R. Campbell will continue the supervision of areal and economic work in New York, Pennsylvania, Ohio, Indiana, Kentucky, and West Virginia. He will be assisted by Messrs Charles Butts, Lester H. Woolsey, Ralph W. Stone, and Marcus Goldman in Pennsylvania, by Mr Myron L. Fuller in New York and Indiana, and by Profs. Geo. H. Ashley and L. C. Glenn in Kentucky.

Prof. T. Nelson Dale will continue his surveys in western Vermont, and will survey the Slatington quadrangle in eastern Pennsylvania. He will be assisted by Prof. Frederick B. Peck and Mr Fred H. Moffit.

Prof. B. K. Emerson will continue his investigations on areal and structural geology in Central Massachusetts.

Prof. J. F. Kemp will complete the fieldwork necessary for the preparation of the Mettawee folio in New York and Vermont.

Prof. Chas. S. Prosser will continue areal work necessary for the prepara-

tion of the Columbus folio, Ohio, and he will be assisted by Mr E. R. Cumings.

Mr Geo. W. Stose will continue in charge of the editing of geologic maps, and will spend a short field season in the continuation of work on the Chambersburg quadrangle, Pennsylvania.

Prof. C. R. Van Hise will continue the supervision of investigations on the pre-Cambrian and metamorphic rocks of the United States. He will visit various parties in the field for the purpose of verifying and coördinating work in his division. He will be assisted by Mr C. K. Leith in the preparation of a final monograph on the Lake Superior region, by Dr W. S. Bayley in the completion of fieldwork in the Menominee district, by Dr W. H. Hobbs in the continuation of surveys in Connecticut and Rhode Island, by Dr Florence Bascom in the continuation of areal and structural studies in the Philadelphia district.

Mr David White will continue his investigations on the paleobotany of the Carboniferous, working in coöperation with various geologists in West Virginia, Ohio, Pennsylvania, and Indian Territory.

Prof. Henry S. Williams will continue his studies on the co-relation problems of the Devonian in Pennsylvania, New York, and Maine. He will be assisted by Mr E. M. Kindle.

Prof. J. E. Wolff will continue the investigation of the areal and structural geology in the crystalline areas of New Jersey and southern Vermont.

Southern States.—Prof. W. B. Clark, with assistants, will continue the investigations of the geology of the Coastal Plain region in Maryland and Delaware, and of the Piedmont plateau of Maryland in coöperation with the Geological Survey of Maryland.

Dr William H. Dall will continue his studies for the completion of the revision of the Tertiary faunas of Florida.

Dr C. W. Hayes will continue the supervision of the investigations on nonmetalliferous economic deposits, and will continue areal work in the southern Appalachians. He will be assisted by Mr W. T. Griswold in the Eastern Ohio oil field and by Mr Edwin C. Eckel in Alabama and Georgia.

Mr Arthur Keith will continue areal, structural, and economic surveys in the southern Appalachians. He will be assisted by Mr H. S. Gale.

Dr W. S. Tangier Smith will be associated with Mr E. O. Ulrich during the early part of the season in the study of the lead, zinc, and fluorspar deposits of western Kentucky, and later will continue his investigation of the lead and zinc deposits of the Joplin district. He will be assisted by Dr C. E. Siebenthal.

Mr E. O. Ulrich will study the geology of the western Kentucky mining district in connection with Dr Tangier Smith's investigation of the mineral deposits. Later in the season Mr Ulrich will be associated with Dr Adams in Arkansas and Mr Taff in Indian Territory.

Mr T. Wayland Vaughn has recently returned from fieldwork in southern Louisiana, Alabama, Georgia, and Florida. He will be engaged throughout the greater part of the coming year in the preparation of a monograph on the fossil corals of the United States.

Alaska.—Four parties, under the supervision of Mr Alfred H. Brooks, are now carrying on geologic work in Alaska. The first, in charge of Mr Alfred H. Brooks, geologist, with Mr D. L. Raeburn as topographer, and five camp hands, is exploring the northern slopes of the Alaskan Range, having for its more especial aim a geologic and topographic reconnoissance of the region. This party expects to obtain important information concerning Mount McKinley, said to be the highest mountain on the continent, which lies in the heart of the Alaskan Range and whose base has not yet been reached. The

party hopes to cross the Tanana River at the mouth of the Cantwell, and to investigate the Tanana and Birch Creek gold districts, reaching the Yukon at Circle City, thus obtaining a chance to examine the important and little known gold fields on the lower Tanana.

Mr Arthur J. Collier, geologist, accompanied by two men, will start at the international boundary and carefully study the coal deposits of the Yukon section as far as the delta, visiting also some of the placer camps accessible from the river, which have not yet been investigated.

The copper deposits of the Chitina River, a tributary of the Copper, have excited a great deal of interest among miners and capitalists. There have been many parties outfitted to prospect this region, and some preliminary development has been made. Prospecting has also been done in a second copper belt in the northern part of the Copper River and in the upper Tanana and White River basins. These two belts are to be the subject of special investigation during the coming season. The Chistochina gold fields, also included in the Copper River basin, have become important producers of placer gold. A survey of their entire area is contemplated. The surveys of the Copper River basin will also throw a good deal of light on the proposed railway route from Valdes to the Yukon River, and they will cover large areas which are believed to have value for stock-raising and for cultivation.

The work in this region has been divided. One party, in charge of Mr F. C. Schrader, geologist, with Mr D. C. Witherspoon, topographer, will map the Upper Copper River Basin and adjacent portions of the Tanana Basin, giving special attention to the upper northern belt; the other party, in charge of Mr T. C. Gerdine, topographer, with Mr Walter C. Mendenhall, geologist, will map the Chistochina gold fields and will give attention to the southern copper belt.

In addition, Mr W. J. Peters, topographer, will make a map of the Juneau mining district as a base for future detailed geologic studies. The Juneau district is the most important in all Alaska, containing, as it does, the famous Treadwell mine.

Hawaiian Islands. — Dr Whitman Cross will suspend his regular fieldwork in Colorado for the present season and will spend a portion of the year in the Hawaiian Islands, for the purpose of investigating volcanic phenomena.

Mr G. K. Gilbert does not expect to carry on any fieldwork, but will be engaged throughout the year in the preparation of reports.

Prof. Lester F. Ward will continue the preparation of reports on the Mesozoic floras of the United States.

FOREST RESERVES

Mr Henry Gannett, in charge of the examination of forest reserves, will examine forest reserves in Utah, and will visit the different parties working in the field under his direction.

Mr Arthur Dodwell will complete the examination of the San Francisco Mountain Reserve of Arizona, and will continue work to the southward and eastward in the Black Mesa Forest Reserve, Arizona, as far as the season will permit.

Mr Theodore F. Rixon will commence the examination of the Black Mesa Forest Reserve, Arizona, completing, with Mr Arthur Dodwell, the entire area of the reserve.

Mr Fred G. Plummer will examine the Uinta Reserve, in the northern part of Utah, a rather narrow, irregular strip of country, lying mainly along the top and north slopes of the Uinta Range.

TOPOGRAPHIC WORK OF THE U. S. GEOLOGICAL SURVEY IN 1902

In Washington, Oregon, and California

WASHINGTON.—Topographic work will be commenced under the general direction of Mr Richard U. Goode, geographer, in two general localities in the State of Washington. Two parties will operate in the eastern part of the state and three parties in western Washington, in the forested regions of the Cascades.

One of the eastern parties will be under Mr L. C. Fletcher, with Messrs J. G. Hefty and J. B. Bond as assistants, and will outfit at Republic. The work will be an extension westward of that commenced during the past season in the vicinity of Republic, the area to be surveyed extending along the international boundary for about thirty miles and including the valley of the Okanogan River and the region adjacent to Osoyoos Lake.

The second eastern party will be under Mr George T. Hawkins, and will outfit at Spokane. The work assigned to this party is the extension of the existing triangulation in the vicinity of Spokane southward through Whitman, Garfield, and Asotin Counties. This triangulation will be followed as soon as may be practicable by a detailed topographic survey, and the resulting maps will in turn form a basis for the investigation of the important economic problems in this region. If practicable this triangulation will be connected during the present field season with that brought northward from the vicinity of the Baker City region by another party, thus making a connection between the astronomic positions determined at Spokane and Baker City.

The western sections will be covered by parties operating in three districts, that in the northwest district being under the charge of Mr R. A. Farmer. The party will outfit at Wenatchee. The area selected to be surveyed will be that known as the Stehekin quadrangle, in the Washington Forest Reserve, and will include the upper portion of Lake Chelan and a portion of the crest line of the Cascade range.

In this general locality will also be a party under Mr E. M. Fry, whose duties will be to determine by spirit-leveling elevations above sea-level of various points in the Cascade Mountains along the Skagitt and Nethow Rivers and in the mountains between Republic and the Colville River.

The party in the central district of the western section will be under the charge of Mr A. E. Murlin, and will survey the Skykomish quadrangle, which includes an area of about 800 square miles north and south of the Great Northern Railroad, in the vicinity of Skykomish, within which are many mines and much valuable timber. A portion of this quadrangle is within the Washington Forest Reserve. Mr Murlin will have for his principal assistants Messrs W. C. Guerin and C. W. Sutton.

Mr A. H. Sylvester will have charge of the third party in the western section, or that operating in the southern district, and will outfit at North Yakima, the work being a continuation of that done during the preceding field season upon the Mt. Aix quadrangle. The greater portion of this quadrangle is in the Mt. Rainier Forest Reserve. It includes a number of passes along

the summit of the Cascades and the headwaters of the White and Cowlitz Rivers, flowing to the west, and of the American, Bumping, and Tieton Rivers, tributaries of the Natches and Yakima Rivers. Mr Sylvester's principal assistant will be Mr Ralph Cowgill.

All the work in the western section is a continuation of the systematic survey, begun several years ago, of the forested areas of the Cascade Mountains.

Oregon.— Topographic work under the direction of Mr Richard U. Goode, geographer, will be continued in Oregon in two localities—one in the eastern portion of the state, in the vicinity of Baker City, and the other west of the Cascades, in the vicinity of Riddles.

The party operating in eastern Oregon will be in charge of Mr C. F. Urquhart, his principal assistant being Mr R. B. Robertson, and will outfit at Baker City. The work will be an extension of the existing triangulation eastward and northward into Union and Wallowa Counties, the object being to provide starting points for future topographic work, which will extend through the forested areas and mining districts. The party will commence work about July 1, and remain in the field as long as the weather conditions are such that work can be prosecuted in the mountains.

In western Oregon one party will be under the charge of Mr A. B. Searle, and will commence operations in the vicinity of Glendale. The work will be in continuation of that commenced during the past field season, and will result in the completion of the Riddles quadrangle, comprising an area of about 900 square miles. This region is noted for its various mineral deposits, the examination and study of which by Mr J. H. Diller, geologist, will follow upon the completion of the topographic map.

Another party, under Mr C. H. Semper, will be engaged in carrying a line of primary levels from a tidal connection at Benicia, California, along the line of the Northern Pacific Railroad as far northward toward Portland as available funds will permit of. Iron benchmark posts, on which will be stamped the elevation above sea-level to the nearest foot, will be established at all prominent points and at intervals not exceeding three miles. These levels will furnish a main trunk line, from which other lines of levels will ultimately branch into the territory to the east and west of the state line, thus furnishing the vertical control for future topographic work

California.—Under the general direction of Mr Richard U. Goode, geographer, topographic work will be prosecuted in various localities in California during the coming field season. In the northern portion of the state a special map will be made of the Keswick mineral region, including an area of about 30 square miles. A portion of this area is included in the Redding quadrangle, which has been recently surveyed on the scale of about two miles to the inch. The special work will be on the scale of about one mile equal to three inches, the large scale being necessary to a proper study of the geologic questions involved in this important district. The party engaged in this work will be in charge of Mr A. B. Searle.

In the central portion of the state two parties will operate, the areas to be surveyed being within or adjacent to the Sierra Forest Reserve. One of the parties will be under the charge of Mr R. B. Marshall, who will have as his principal assistants Messrs George R. Davis and L. D. Ryus. The party will outfit at Fresno, and will complete the survey of the Kaiser Peak quadrangle commenced during the previous season, which includes the upper portion of the San Joaquin River. This party will also extend spirit levels so as to afford vertical control for future topographic work in the Mount Silliman and Kings River Canyon region.

The second party in central California will be in charge of Mr E. T. Perkins, who will have as his principal assistants Messrs A. I. Oliver and W. V. Hardy. This party will outfit at Visalia and will survey the Kaweah or Three Rivers quadrangle, an area of nearly 1,000 square miles, including the headwaters of the principal tributaries of the Tulare River.

In southern California there will be two parties. One of these parties, under Mr W. T. Turner, with Mr S. N. Stoner as his principal assistant, will continue the work which has been going on for several years in the Mount Pinos and Zaca Lake and Santa Ynez Forest Reserves.

The other party, under Mr J. E. Rockhold, with Mr E. R. Childs as his principal assistant, will complete the work begun during the past field season in the vicinity of San Diego, thus finishing the mapping of practically all of the thickly inhabited portion of southern California.

Precise spirit-leveling will be continued by a party under Mr C. H. Semper. This party will first complete a gap in the line which was begun during the last field season at a tidal connection at Benicia and carried through the San Joaquin Valley and across the Tehachapi Mountains, so as to make a junction with spirit levels previously run in southern California. After this work is completed the party will go north to the vicinity of Sacramento and commence another precise line which will have its ultimate termination at Portland, Oregon. In connection with this line iron bench-mark posts will be established along the line of the Southern Pacific Railroad at intervals of about three miles, on which will be stamped the elevation to the nearest foot above sea-level.

In the fall, after it becomes too late to work in the northern states or the high Sierra, two large parties will commence work along the Colorado River, one outfitting at Yuma and the other at Needles. This work is undertaken with a view of determining the practicability of utilizing the waters of the Colorado River, which at present are wasted into the ocean, for the purpose of irrigating the vast tracts of desert lands in California and Arizona adjacent to the river.

Later in the season it is also contemplated to do certain preliminary work looking eventually to the topographic mapping and geologic investigation of the Coalingua, Bakersfield, and McKittrick oil fields.

GEOGRAPHIC NOTES

NEW KEY TO THE REPORTS OF THE U. S. GEOLOGICAL SURVEY

THE U. S. Geological Survey has just issued, in Bulletin No. 177, a catalogue and index of its publications. This compilation has been made necessary by the increase in the number of the publications since the last catalogue was published in 1893 and by the need of a convenient classification.

The first part of the compilation is composed of notices of all the Survey's publications from its inception to date; the annual reports, monographs, bulletins, water supply, and irrigation papers, the volumes of the old series of mineral resources, geologic atlas folios, topographic atlas sheets, special maps, and miscellaneous publications.

The second portion of the volume is an index, alphabetically arranged, com-

prising 742 pages. It is a broad classification of the subject-matter of the publications, yet sufficiently detailed to be of value in economic, scientific, engineering, and educational lines.

DECISIONS OF THE U. S. BOARD ON GEOGRAPHIC NAMES

June 4 and 5, 1902

Barnett; run, near Bridgeport, Harrison County, West Virginia (not Barnet).

Bentons Ferry; post-office and railroad station, Marion County, West Virginia (not Benton Ferry).

Bonaire; island, one of the Dutch West India Islands, in the Caribbean Sea, off the coast of Venezuela (not Buen Ayre).

NOTE.—This is a reversal of the decision Buen Ayre, made in 1891.

Cobun; creek, in Monongahela County, West Virginia (not Coburns).

Connorville; post-office and railroad station, Jefferson County, Ohio (not Connor nor Connorsville).

Davisson; run, branch of West Fork River, Harrison County, West Virginia (not Davidson's).

Davisson; run, branch of Simpson Creek, Harrison County, West Virginia (not Davidsons).

Fassett; point, Sinepuxent Bay, Worcester County, Maryland (not Fassetts nor Henry).

Fudges; creek and post-office, Cabell County, West Virginia (not Fudger).

Gibson City; post-office and railroad station, Ford County, Illinois (not Gibson).

Glenns; run, Ohio County, West Virginia (not Glen's).

Glenns Run; railroad station, Ohio County, West Virginia (not Glens Run).

Green Village; post-office and railroad station, Franklin County, Pennsylvania (not Greenvillage).

Horrell; precinct, Frontier County, Nebraska (not Howell).

Hupa; Indian tribe, mountain, and post-office, Humboldt County, California (not Hoopa, Hoopah, Ho-pah, Hupâ, Húpô, Noh-tin-oah, nor Up-pa).

Hupa Valley; Indian agency and reservation, Humboldt County, California (not Hoopa Valley).

Inner Manchas; coral reef or bank on north side of entrance to Mayaguez Bay, Porto Rico, West Indies (not Inner Machos, etc.).

Jaffrey; point, the southern point of entrance to Portsmouth harbor, New Hampshire (not Jaffray nor Jerry's).

NOTE.—This is a reversal of the decision Jaffray, made March 7, 1900.

Kenneatto; creek, Fulton and Saratoga Counties, New York (not Fonda nor Kennyetto, etc.)

Lehi; post-office and railroad station, Utah County, Utah (not Lehi City).

Machos Grandes; coral reef or bank on south side of entrance to Mayaguez Bay, Porto Rico, West Indies (not Allart, Great Manchas, nor Machos).

Manchas; coral reef or bank on north side of entrance to Mayaguez Bay, Porto Rico, West Indies (not Machos Grandes).

Manchas Chicas; coral reef or bank on north side of entrance to Mayaguez Bay, Porto Rico, West Indies (not Machos Chicos).

Outer Manchas; coral reef or bank on northern side of entrance to Mayaguez Bay, Porto Rico, West Indies (not Outer Machos).

Pereleshin; mountain, east of the Stikine River and near the Alaska-Canada boundary line (not Pereleshini).

Provo; post-office and railroad station, Utah County, Utah (Not Provo City).

Raquette; lake, Hamilton County, New York (not Racket).

Raquette; pond, Franklin County, New York (not Racket).

Raquette; river, of northern New York, draining lake and pond of same name, and emptying into the St. Lawrence River (not Racket).

Raquette Lake; post-office and railroad station, Hamilton County, New York (not Racket Lake).

Sea Gull; six rocky islets between Unalga and Akutan, in Akutan Pass, eastern Aleutians, Alaska (not Baby nor Gull).

Southmayd; post-office and railroad station, Grayson County, Texas (not Southmayde).

Steel; mountain in the Olympic group, Jefferson County, Washington (not Steele nor Stone).

Valdes; glacier, narrows, port, summit, and town, Prince William Sound, Alaska (not Valdez).

Van Etten; post-office, railroad station, township, and village, Chemung County, New York (not Vanetten).

West Fork; river, in Marion, Harrison, and Lewis Counties, West Virginia (not West Fork Monongahela).

Wheeling; creek, Ohio and Marshall Counties, West Virginia (not Big Wheeling).

Wheeling; island in Ohio River at Wheeling, West Virginia (not Madison nor Zanes).

Willow Island; railroad station, Dawson County, Nebraska (not Willow).

COMMERCIAL ALASKA

THE title of a monograph just issued by the Treasury Bureau of Statistics is "Commercial Alaska in 1901." In it are presented some striking figures about this little-understood territory of the United States. A million dollars a month is the estimate made by the Bureau of Statistics of the present value of the market which "frozen Alaska" offers to the producers and manufacturers of the United States.

Gold, fish, and furs are, according to this monograph, the principal industries of Alaska at the present time, and they send to the United States 15 million dollars' worth of their products—8 millions of gold, 6 millions of fish, chiefly salmon, and the remainder furs.

The cost of Alaska was $7,200,000. The revenue which the government has derived from it since its purchase amounts to over 9 million dollars, and the value of the products are now twice as much every year as it cost. The total value of the products of Alaska brought to the United States since its purchase is (according to the best estimates that the Bureau of Statistics is able to make) about 150 millions. of which 50 millions are precious metals, 50 millions products of the fisheries, chiefly salmon, and 50 millions more furs, chiefly seal fur. Probably 50 million dollars of American capital are invested in Alaskan industries and business enterprises, including transportation systems. In the salmon fisheries alone the companies engaged have a capitalization of 22 million dollars, and the value of their plants, including vessels, is given at 12 million dollars. In the mining industries there are large investments, the great quartz mill at Juneau being the largest quartz stamp-mill in the world, while several other quartz mills represent large investments.

The Mazamas.—The annual outing of the Mazamas this summer is a trip to the summit of Mount Adams. The Mazamas are a society of mountain climbers and one of the most unique organizations in the United States. The qualification for membership is the ascent of some snow-capped peak formidable enough to make the ascent more than a pleasure trip. The society was organized in the summer of 1894, on the summit of Mount Hood. So much enthusiasm was felt at that time that 193 people climbed the 11,225 feet to the summit of Mount Hood in order to attend the first meeting. Each year the club makes successful expeditions up some mountain. Mounts Baker, Rainier, Adams, Hood, and Jefferson, as well as Crater Lake, on the summit of Mount Mazamas, have each been visited.

An expedition to take meridian measurements in the Arctics, north of Spitzbergen, left Tromsö late in July. The expedition was organized in Sweden, and is directed by Dr P. Rubin and includes Dr von Zeipal as astronomer and Lieu. Duner as cartographer.

GEOGRAPHIC LITERATURE

Mosaics from India. By Margaret B. Denning. Illustrated. New York: Fleming H. Revell Co.

The title of this book is well fitted to its contents. Each chapter is a story in itself. The customs of the people are set forth by graphic terms and illustrations. The author shows the opposition that has been brought against the missionaries by the superstitions of

the people. Many new points of the inner side of the social conditions of the Hindoo family are depicted in a vivid manner. Chapters devoted to The Recent Famine, The Classes of Society, The Missions, etc., describe in an interesting and instructive manner the observations of a personal tour of the far regions of country by the missionary author.

Bird Life, a Guide to the Study of Our Common Birds. By Frank M. Chapman. 8vo, pp. xii + 195, with Appendix, with 75 colored plates and 25 text cuts. Third edition. New York: D. Appleton & Co. 1902.

The study of birds has become popular and, let us hope, not a fad or a craze, to run its course and disappear, but a permanent feature of the rising interest in science; for no more delightful interest can be added to life than the study of our feathered neighbors, making their personal acquaintance, familiarzing ourselves with their home life, their housekeeping methods, their loves, and their hates.

Mr Chapman has given the public one of the best of many volumes which have been called into being to minister to this interest. The first part is devoted to feathered creation in general—describing the bird's anatomy, colors, and change of color, migrations, songs, and nesting seasons. Popular descriptions of common species follow, and are illustrated with colored plates. Without depreciating the text in the least, the colored illustrations are the most valuable feature of the work. Well drawn and well reproduced, they alone aid the amateur more in identifying species than any amount of description could do. It would be better if the colored figures were placed in juxtaposition with the related text, instead of being widely separated from it.

The book closes with an appendix for the use of teachers. H. G.

Practical Forestry — For Beginners in Forestry, Agricultural Students, Woodland Owners, and others desiring a general knowledge of the nature of the art. By John Gifford. 8vo, pp. xiv + 284, with 35 illustrations. New York: D. Appleton & Co. 1902.

Part I opens with a collection of excellent definitions, and the succeeding chapters treat in turn of the relation of silviculture to the broad subject of agriculture, the forest canopy and floor and the wood mass, the geographic distribution of forests and their geographic effects. Part II is devoted to the formation and tending of forests, Part III to their industrial importance, the wood industries, etc., while the concluding part, after listing the forest reserves, describes the principal forest trees.

Among the numerous books on Forestry recently published, this will deservedly stand high. Where there is so much to praise, it seems almost captious to criticise. Certain of the methods of restoring forests here described—*i. e.*, to restore forests by replanting trees—is a method that will not be followed in this country on any considerable scale for centuries, however applicable it may be to the countries of Europe. The author confuses the plains and the prairies, and is still among the agnostics concerning the influence of forests on rainfall. H. G.

A Ride in Morocco Among Believers and Traders. By Frances Macnab. 8vo, pp. 367, with 10 illustrations and 1 map. New York: Longmans, Green & Co. 1902.

This is a narrative of a journey down the coast of Morocco to Mazaglan, and thence south to the city of Morocco (Marakesh), returning to the coast at Mogador. Miss Macnab is an experienced traveler and observer, and her journal and the accompanying observations on the country and people are

graphic and of great interest. The utter rottenness of the government and the degradation of the people under its oppression are scarcely conceivable. It is a picture of the retrogression, for these are the Moors whose ancestors made the civilization of Spain.

Altitudes in the Dominion of Canada, with a relief map of North America. By James White, geographer, Department of the Interior. Ottawa, 1901.

This is the first comprehensive collection of elevations in Canada to be published, those of Messrs J. W. Spencer and Warren Upham, published by the U. S. Geological Survey, relating to portions only of the Dominion. The publication comprises abstracts of the profiles of the railways and canals, profiles of rivers, and many miscellaneous heights, including levels of the Great Lakes, arranged geographically. As to fullness and accuracy, the work leaves little to be desired. The arrangement, however, is not a convenient one, and should have been at least supplemented by a full index of names of places. The relief map, printed in tints, is a very valuable addition to our knowledge of the northern part of our continent.

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